

T-CELL THERAPY AGAINST PATIENT-SPECIFIC CANCER MUTATIONS

SUMMARY

The National Cancer Institute seeks parties interested in collaborative research to co-develop or license T-cell therapy against cancer mutations.

REFERENCE NUMBER

E-233-2014

PRODUCT TYPE

- Research Materials
- Therapeutics

KEYWORDS

- T-cell, T cell
- cholangiocarcinoma, immunogenic

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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DESCRIPTION OF TECHNOLOGY

Human cancers contain genetic mutations that are unique to each patient. Some of the mutated peptides are immunogenic, can be recognized by T cells, and therefore, may serve as therapeutic targets.

Scientists at the National Cancer Institute's [Surgery Branch](#) developed a method to identify T cells that specifically recognize immunogenic mutations expressed only by cancer cells. The scientists identified cancer-specific mutations from a patient with widely metastatic cholangiocarcinoma by sequencing tumor samples and comparing with normal cells. Using tandem minigene constructs encoding all of the mutations expressed by a patient's tumor, the inventors identified T cells that recognized the immunogenic mutations from the same patient. These mutation-reactive T cells have the potential to eliminate the cancer cells while sparing normal tissues since normal tissues do not express the mutations. The mutation-reactive T cells were expanded *in vitro*, and then infused as a highly pure population back into the same patient. The patient experienced tumor regression when treated with this approach.

POTENTIAL COMMERCIAL APPLICATIONS

- Personalized immunotherapy with mutation-reactive T cells for mediating tumor regression in patients with immunogenic mutations.
- Mutation-reactive T cell therapy especially beneficial for cancer patients refractory to other therapies.
- A research tool to identify patient-specific immunogenic mutations in the tumor.

COMPETITIVE ADVANTAGES

- This patient-specific therapy has the potential application to most epithelial cancers, which account for about 90% of cancer deaths in the United States.
- Personalized mutation-specific T cells recognize mutations harboring tumor cells only and spare normal tissues. This therapy has no tissue toxicities comparing to traditional chemotherapy and radiotherapy.
- The infusion of a highly pure population of these mutation-specific T cells may maximize therapy and result in regression of all target lesions.

INVENTOR(S)

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DEVELOPMENT STAGE

- Clinical

PUBLICATIONS

Tran E, et al. [[PMID 24812403](#)]; Robbins P, et al. [[PMID 23644516](#)]; Tran E, et al. [[PMID 25046408](#)]

PATENT STATUS

- **U.S. Filed:** PCT Application No. PCT/US2014/058796 filed October 2, 2014

THERAPEUTIC AREA

- Cancer/Neoplasm